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Infants and Mothers: Linked Lives and Embodied Life Courses

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Abstract and Keywords

There is a burgeoning interest in the variable ways in which past and present societies construct the notion of foetal and infant entities and the beginnings of personhood. The newborn baby has often been conceptualized as a tabular rasa, a blank slate, which progressively becomes moulded by biological, environmental, and social forces. Within this construct the infant is likened to clay and indeed this analogy is made explicit in early medical writings. However, infants are conceived and born into social worlds and these impact on their nascent identities whilst still in utero. Likewise, cultural beliefs concerning gender identity, reproduction, and the pregnant body may have biological repercussions for the developing foetus. This chapter aims to explore the interplay between the body and society in the formation and conceptualization of infant bodies in the past.

Keywords: foetus, infant, newborn, cultural beliefs, body, pregnancy, environment, personhood

There is a burgeoning interest in the variable ways in which past and present societies construct the notion of foetal and infant entities and the beginnings of personhood (e.g. Moore 2009; Finlay 2013; Lupton 2013). The newborn baby has often been conceptualized as a *tabular rasa*, a blank slate, which progressively becomes moulded by biological, environmental, and social forces. Within this construct the infant is likened to clay and indeed this analogy is made explicit in early medical writings (e.g. Soranus' *Gynaecology* of the first/second century AD). However, infants are conceived and born into social worlds and these impact on their nascent identities whilst still *in utero*. Likewise, cultural beliefs concerning gender identity, reproduction, and the pregnant body may have biological repercussions for the developing foetus. This chapter aims to

explore the interplay between the body and society in the formation and conceptualization of infant bodies in the past.

Foetal and infant development and early life experiences are now known to be of central importance for adult health and wellbeing (Barker et al. 2002). As a consequence, there has been a shift towards a greater focus on the relationship between early childhood development and social adversity within current medical research. In particular, over the last decade research into epigenetic processes (those which regulate gene expression) have become central to debates concerning infant and child care in the contemporary world. For example, a variety of epigenetic studies have highlighted the ways in which social processes such as inequalities (as a consequence of status, gender, ethnicity) can alter, not the genotype, but gene *expression* (Hertzman 2012). Through this mechanism, aspects of society come to be literally embodied within the biological tissues of infant bodies (Thayer and Kuzawa 2011).

The implications of such research for the archaeological study of foetal and infant remains has yet to be explored within archaeological research. Furthermore, the impact of epigenetic research for our conceptualization of individual life courses is (p. 105) also potentially profound and requires consideration. The cumulative characteristics of individual and related biographies (e.g. mother/child) is discussed here, particularly in relation to early life experiences. It is argued that life courses become inter-woven over generations, thus challenging the Western concept of the life course as a discrete, individualized trajectory, with a beginning and an end. Instead, it is proposed here that in archaeological studies of childhood in the past we need to consider the concept of ‘linked lives’ (first coined by Elder in 1974) and entangled life courses, whereby biographical margins are fuzzy and overlap between the generations. Before progressing, it is worth briefly reviewing some of the theoretical developments within age and life course research over the past few decades in order to provide a context from which to explore the impact of epigenetics for archaeological approaches to infancy.

Cycles, cohorts, and courses

Age has been conceptualized largely as a chronological phenomenon, which becomes embodied through the physiological processes of growth and, ultimately, degeneration. While ageing may be considered a universal, time-linked process, people grow up and grow old within different social and physical environments and these all impact upon the experience of ageing both physiologically and in terms of social identity (Gowland 2006; Sofaer 2006). The term ‘life cycle’ is no longer used to describe stages of life within social science discourse, though it may still feature in the medical literature. The concept is now considered to be too prescriptive and has been criticized as presenting life as a series of fixed chronological and biological phases (Hunt 2005). Social scientists now adopt a life course perspective when examining age, conceptualizing it as a series of ‘life pathways’ and transitions occurring over the trajectory from conception to death (Marshall 1996; Moen 1996: 181). This perspective on age has provided a useful framework for archaeologists to consider both the plurality of identity at any one moment in time as well as the fluidity of identity (e.g. gender and status) over an individual’s life (Hockey and James 2003). It also recognizes the cumulative nature of individual biographies; in other words, it explicitly considers the way in which identities and experiences in early life may impact upon later stages (Hockey and Draper 2005: 43). This is a departure from the earlier ‘life cycle’ approach to age, because rather than assuming a ‘pre-determined map’ for the ageing process, one’s identity and physiology at any moment in time is borne out of earlier phases which may have diverging effects on individual trajectories.

> A life course approach takes fully into account the fact that our lives are ongoing processes and not just single states or events that can be adequately captured and understood using snapshots.
>
> Levy and the Pavie Team (2005: 4)

(p. 106) The life course experience is also one that is now understood as being embedded within the social and historical matrix of a society and hence can only be interpreted in relation to these factors (Hunt 2005). Engaging with the historical context allows a consideration of the impact of significant technological, political, or other societal events on individual and shared biographies (e.g. the experience of being a child during World War II, or the Great Depression: Elder 1974). As a consequence, there is a greater emphasis on the specificity of life experience and within this model, ‘age cohorts’ are regarded as particularly significant. A cohort refers to individuals who are born within a few years of each other and therefore experience similar historical and social events which impact upon their lives and identities (Hunt 2005). Individuals within particular age cohorts are the product of events that occurred during their lifetimes, and their identities (biologically and socially) are forged by these shared experiences, creating intragenerational bonds and intergenerational disconnects. For example, the values and

attitudes of an older generation may differ from those of their children and grandchildren; not in any uniform, generic sense, but as a consequence of their particular upbringing and life histories.

The cohort aspect to life course studies is problematic when examining the archaeological evidence. Within the funerary sphere, except in exceptional circumstances, such as catastrophic events (e.g. cemeteries arising in the wake of the Black Death which struck Europe from the mid-fourteenth century AD), age cohorts are almost impossible to isolate; we may identify individuals of the same age, but they were not necessarily from the same generational cohort and this potentially complicates interpretations. Nevertheless, the life course approach has been consequential for the study of age within archaeology, because it has enabled a greater exploration of the culturally contingent nature of age identity and the fluidity of identity over a person's lifetime (e.g. Harlow and Laurence 2002; Gowland 2006; Gilchrist 2012). When considering age identity in the past, the cemetery context is a particularly fruitful form of evidence because of the direct link that it provides between the physiological body and the cultural aspects of burial practice. The importance of the skeletal remains of past bodies for interpreting funerary data has also been highlighted over recent years (e.g. Gowland and Knüsel 2006; Sofaer 2006; Knudson and Stojanowski 2008; Duday 2009). This is influenced by theoretical developments within the social sciences more broadly, which seek to integrate the physical body as an important component of social interaction. Since the 1990s, the body has been reconceptualized as a mediator of both social and biological processes (Shilling 1993). This represents an important departure from earlier approaches which viewed the body as a purely biological entity and largely irrelevant for interpretations of cultural practice. This traditional model has been critiqued for failing to engage with the physical reality of the body and the interaction between the body and society (Scheper-Hughes and Lock 1987; Shilling 1993; Krieger and Davey Smith 2004).

(p. 107) In relation to age, the passing of time as a lived experience can be rather abstract, and while we are aware of it through the passing of days and seasons, it only crystallizes for many individuals through embodied experiences: through seeing our children grow, through greying hair and wrinkling skin, and our own embodied interactions with others; how they relate to us and we to them. This confrontation with embodied experience enables the reality of time and age to be made real to us in a way that is tangible. By considering life course stages, such as infancy in relation to biological remains, we are not returning to a position of biological determinism, but are instead acknowledging the 'tripartite relationship between social environment, human agency and the body' (Hockey and James 2003: 135).

Age as an aspect of social identity differs in a fundamental way from other identities: we may know what it is to be *either* male *or* female within our own social context, but the age that we are at a particular moment in time is a cumulative one; we have passed in and out of numerous younger age transitions. As we grow and ultimately degenerate, fragments of our younger lives are retained within both our social and biological memories. In relation to the latter, we come to literally embody our life histories. For example, our

childhood (and foetal environment) has the potential to impact on our health and wellbeing later in life (Barker et al. 2002). From an archaeological perspective, we retain traces of the lives that we have lived within the soft and hard tissues of our bodies, from the biomolecular to a macroscopic level. The tissues of our bodies become saturated by the social fabric in which we interact and these become fossilized within our bones and teeth (Robb 2002; Sofaer 2006; Gowland and Thompson 2013). In turn, aspects of our physicality forge our social identities—the relationship is dynamic. The temporal nature of the body is proving particularly important when examining past life courses. For example, when performing isotopic analysis on an adult skeleton, depending on which bones or teeth are sampled, information relating to a variety of earlier phases of life can be obtained, from infancy onwards, because each of these tissues was formed at a different age, or remodels at a different rate (Beaumont et al. 2015).

A further development in life course research relates to a greater awareness of the interdependence of life course trajectories and roles. As Macmillan (2005: 6) notes: 'lives unfold in multidimensional ways'; each individual experiences a number of different interlocking roles, leading to marked heterogeneity in age identity. Also related to this is the concept of 'linked lives' (Elder 1974): the recognition that individuals are not monadic entities; strong interdependencies exist in terms of the life course trajectories of related individuals (Levy and the Pavie Team 2005: 6). These relationships have been discussed briefly before in life course research in archaeology in relation to burial rites (e.g. Gowland 2006) and infant care (see Redfern, Chapter 24 and Lewis, Chapter 25 of this volume), but the interconnectivity of age identity is often not explicitly stated. Instead, archaeologists tend to focus on individual life courses and life course stages as discrete and separate entities.

(p. 108) The beginnings of life

The beginnings of life and the treatment of foetal and infant remains have been a particular focus of scholarly interest within the social sciences over the last decade (e.g. Cecil 1996; Gottlieb 2000; Hockey and Draper 2005; Finlay 2013; Lupton 2013; Gowland, Chamberlain, and Redfern 2014; see also Carroll, Chapter 8 of this volume). In a special edition of *World Archaeology*, Finlay (2013: 207) brought together a number of papers on this subject stating that:

> Constructs of relational personhood highlight the fluid, contingent liminalities of the social project and the changing configuration of foetal ontologies . . . The myriad ways by which life is thus brought into social being condition the significances accorded to the agency and actions of the embryo/foetus and whether this nascent entity, the pregnant women herself, or others are given primacy.

Related to this is the concept of the beginnings of personhood, which is culturally ascribed and therefore highly variable (Kaufman and Morgan 2005: 321). This variability has been discussed in numerous anthropological accounts that identify delays in conferring personhood, long past the day of birth. While this appears to be such a strong marker of the beginning of life for us today, it is arguably an arbitrary point in the continuum. The acquisition of personhood is often marked by a discrete rite of passage (e.g. baptism, or the *dies lustricus* in the Roman world; see Carroll, Chapter 8 of this volume), though in actuality it tends more often to be a *process* rather than an event. For example, in the Western world a newborn is often referred to as 'the baby', for some time after being named, suggesting a transitional process of acquiring personhood (Gowland, Chamberlain, and Redfern 2014). For the many cultures that believe in reincarnation (e.g. some West African and Native American groups), the newborn may represent a particularly ambiguous entity; one which is simultaneously new and old (Kaufman and Morgan 2005). Reincarnation implicates a very different life course model and one far removed from the linear and individualized conception subscribed to in the Western world. This concept of reincarnation will be discussed again towards the end of the chapter in relation to the impact of epigenetics on life course biographies.

Within archaeological discourse, unborn and newborn infants have often been conceptualized as passive and universal entities. However, the presence of an infant (both born and unborn) may have a profound influence on the behaviour of those around them, most particularly the mother (Gowland, Chamberlain, and Redfern 2014). Motherhood marks a transition towards a new embodied identity through cognitive and physiological changes (e.g. production of breast milk, changes in body shape), which may also be marked by shifts in material culture, such as clothing and adornment. For example, it has been argued by Fischler (1998) that a Roman female (who may marry from the age of 12 years) could only take on the truly gendered identity of a woman after she had given birth. For many, 'parenthood' is a strong marker of identity (p. 109) and adulthood (Macmillan 2007). Identities are forged from the societal and relational roles that we play and parenthood may be considered one of the most dominant. This leads to the question of whether a woman is still conceptualized as a mother if her infant dies. In many societies, the answer to this would be yes; an ethnographic example is provided by Woodburn (1969), who observed that, amongst the Hadza of East Africa, a female whose first child lived for only two days continued to wear the necklace that symbolized motherhood. This identity may be maintained even for those pregnancies which do not reach fruition, or for those whose infants die shortly after birth (Gowland, Chamberlain, and Redfern 2014). Transitions are often born in pain; the very act of going through childbirth may be viewed as a rite of passage as important as any other in terms of a woman's identity. The death of the infant or the delivery of a stillborn child does not necessarily erase or invalidate this experience; indeed, it potentially taps into a more acute strand of pain in terms of the ensuing emotional rupture. The effect of losing an infant late in pregnancy on the mother is important to consider in archaeological interpretations of infant burials, because their funerary rites may be predicated more on the social perceptions of motherhood than of the dead infant. This is rarely considered,

however, in interpretations of the archaeological burial evidence. For example, the presence of foetal remains, along with perinates (infants dying around the time of birth) is common at Romano-British sites, yet interpretations of these burials have been almost entirely dominated by discussions of infanticide (Mays 1993; Mays and Eyers 2011), rather than concepts of the beginnings of life and motherhood in Roman Britain (Gowland 2002; Moore 2009; Gowland, Chamberlain, and Redfern 2014; Millet and Gowland 2015). Indeed, the mothers of these infants have often been disregarded as prostitutes or slaves, who were disposing of their unwanted or murdered offspring (Mays and Eyers 2011). Another possible interpretation is that in the Roman world, foetal and perinatal infants were still considered to be an indivisible part of the mother and so were buried in close proximity to her (Millet and Gowland 2015). This is something that has been observed cross-culturally; for example, in Ecuador, abortion is considered self-mutilation because the foetus is not seen to be separate from the mother (Lupton 2013). In the Western world, where the developing foetus and mother has increasingly been conceptualized as distinct, nonetheless, some women even in late pregnancy have difficulty conceiving of the foetus as separate from themselves (Lupton 2013).

Interpretations of infant burials, primarily in terms of disposal, deny the agency of infants to affect those around them emotionally, physically, and economically (Gowland, Chamberlain, and Redfern 2014). Murphy (2011: 413) has lamented the lack of engagement by archaeologists with the ‘powerful physiological responses that are associated with pregnancy, birth and motherhood’. She presents a variety of archaeological and historical data to highlight the fact that infants buried within *cilliní*, who appear to have been marginalized in death, were nevertheless mourned by their families (Murphy 2011). Recent work has begun to explore the variable cultural responses to miscarriage and stillborn infants in terms of grief and burial rites (e.g. Cecil 1996; Murphy 2011; Finlay 2013). Today, funerals may be held for foetuses lost even very early on in pregnancy and stillborn infants are now accorded a much greater visibility in the funerary sphere than observed in recent historical periods (Hallam, Hockey, and Howarth (p. 110) 1999). The changing ontological status of the foetus over time has received attention from a variety of sociologists. Most recently, this has occurred in relation to the impact of current medical imaging technologies, such as ultrasound, which allow the developing infant to be viewed *in utero*, and this has contributed to a reconfiguration of foetal identity (Lupton 2013).

Hockey and Draper (2005: 54) have stated that studies of the life course have tended to be constrained by the ‘twin gateposts of birth and death’; thus omitting the significance of life before birth. With respect to foetuses this effectively ‘eradicates their potential importance for the living and so excludes them from any comprehensive account of the life course as a social, intersubjective process’ (Hockey and Draper 2005: 54). Hockey and Draper (2005) also refer to embodiment by proxy, and discuss the various ways in which the presence of the developing foetus becomes embodied through the performativity of the mother. For example, women today, even prior to conception, may adopt embodied strategies in order to improve their own preconception health through exercise, diet, vitamin supplements, and restricting alcohol intake. Once pregnant, the

choice of bodily indicators that life has started is also culturally contingent (e.g. pregnancy test, halted menstruation, foetal movements, 'quickening') (Hockey and Draper 2005). The pregnancy, while initially 'invisible' to others, has immediate physiological consequences for the mother (e.g. tiredness, sickness). In turn, the developing embryo is conceptualized by the expectant mother, not as 'a bundle of cells', but as a future embodied child, encompassing parental hopes and dreams.

The topic of motherhood and the way in which the developing foetus and infant can alter the identities of the pregnant women, as well as the families more generally, has been largely neglected within archaeological discussions, which have centred more on patterns of infant burial and infant care. While these topics are important to explore, we must consider that identities are situated within the trajectory of the life course and are relational and socially linked: husband/wife, parent/child. There is also an obvious biological link in terms of parents passing genetic information onto their infants. However, this concept can also be extended to the inheritance of *social* biographies and it is the repercussions of this concept for our conceptualization of foetal/infant entities and mother/infant biographies that is explored further below.

Embodiment, epigenetics, and 'embedding'

> A new generation of studies is advancing the prospect that epigenetic differences may constitute a biological vestige of early exposures, potentially altering the expression of genes affecting metabolic and physiological pathways and changing trajectories of individual development.
>
> Hertzman (2012: 17166)

(p. 111) The role of molecular epigenetics in developmental plasticity has been the subject of intense investigation and interest over the last decade. Epigenetic factors refer to those which alter patterns of gene expression, while not changing nucleotide sequences of the DNA (see, amongst others, Landecker and Panofsky 2013, for a discussion of epigenetic processes). A dramatic and famous example of epigenetic processes in action is provided by the Dutch Famine (1944–5). Average food rations during this five month period in the Netherlands decreased in calorific content to as little as 400–800 kilocalories per day and slightly more for pregnant women. Food supplies returned to normal levels not long afterwards and so this period represents a discrete, well-documented, famine event affecting known individuals. The physiological ramifications of this event for those foetuses developing *in utero* at the time has been studied intensively. The harsh environment did not affect linear growth but resulted in 'a disturbed central regulation of the accumulation of body fat in later life' (for further details see Ravelli et al. 1999; Roseboom, van der Meulen, and Ravelli 2001). As a consequence, individuals affected by the famine during gestational development were found to be more susceptible to obesity, diabetes, and cardiovascular disease later in life.

In the case of the Dutch Famine, the epigenetic changes to gene expression occurred *in utero* as an adaptive response to maximize the infant's chances of surviving when born into an environment in which food was scarce. The fact that they were, in fact, born into a world in which food supplies soon returned to normal meant that, in this instance, these processes resulted in a mismatch between the intrauterine signals and the post-natal environment (Gluckman, Hanson, and Low 2011: 13). The Dutch Famine event directly impacted on three generations: the expectant mother, the developing female fetus, and the grandoffspring, because the daughter produced all of the eggs that she will have during her lifetime, whilst still *in utero* (Barker 2012).

There is now a new field of research known as 'nutritional epigenetics' that examines food as a crucial factor in the regulation of gene expression and phenotypic plasticity (i.e. altering appearance) (Landecker 2011). A substantial body of research has demonstrated the way in which suboptimal conditions during foetal development and infancy can have epigenetic effects that remain stable throughout the offspring's life course (mitotic stability). As Landecker (2011: 177) discusses in regards to the Dutch example, 'this is a model in which food enters the body and, in a sense *never leaves it*, because food transforms the organism's being as much as the organism transforms it'. However, it is not just nutrition that influences gene expression, factors such as maternal stress have also been shown to be significant for mental and physiological wellbeing in later life (Hertzman 2012). For example, stress during pregnancy has been shown to have an effect on the stress reactivity of the offspring, even after their birth. Differences in maternal care in early infancy have also been shown to have long-lasting consequences for epigenetic processes which help regulate adult stress reactivity (Weaver et al. 2004).

Adverse environmental or social conditions have also been shown to affect the second generation of offspring (Davey Smith 2011; Gluckman, Hanson, and Low 2011). The significance of these findings cannot be underestimated as they provide an unassailable **(p. 112)** and direct link between biology and society, revealing how an individual's physical and social world in early life can shape their biological processes (including health) across their own life course, and those of their children and grandchildren (Thayer and Kuzawa 2011: 798).

There are many significant medical and socially significant outcomes and implications to arise from this epigenetic research (see Landecker and Panofsky 2013 for a summary). Of particular relevance for life course research, however, is that it demonstrates the way in which life histories can become intertwined via epigenetic processes. Lives become linked on a social level, but also biologically, to the extent that research on the life course must extend beyond the day of birth, beyond even conception, to when the mother was a foetus, and her mother before her. When social factors affecting our grandmothers, have repercussions for our own ontogeny and embodied identity, at what point in time does our biography actually begin (Gowland and Newman, forthcoming)?

Implications for the archaeology of childhood

The implications of this new paradigm for the study of foetal and infant remains within archaeological discourse are explored below, particularly in relation to bioarchaeology. There are a number of key factors that should impact upon our interpretations of the archaeological data. Over recent years there has been a move towards a 'social bioarchaeology' (e.g. Gowland and Knüsel 2006; Sofaer 2006; Knudson and Stojanowski 2008, 2009; Agarwal and Glencross 2011). This theoretical move has been informed by the burgeoning research on the interrelationship between the body and society from across the social sciences and philosophy. Epigenetics has provided a unique contribution to these debates, demonstrating a mechanism whereby the social and biological sciences can be more completely reconciled (Landecker and Panofsky 2013). The science/theory boundaries which continue to dominate archaeological research are no longer sustainable when this construct is being so consistently challenged.

Epigenetic research has also enabled epidemiologists to recognize that disease arises from the accumulation of risk throughout life, and this also includes the lives of our immediate ancestors (Davey Smith 2011). Interpretations of the evidence for past health from skeletal remains must also attempt to tease out the biological traces of pre-existing social onslaughts (Gowland and Newman, forthcoming). Furthermore, there is still a tendency to interpret palaeopathological evidence primarily in terms of environmental rather than social variables. Research on contemporary populations demonstrates that health disparities have social origins (Thayer and Kuzawa 2011: 798), and therefore greater consideration should be given to the heterogeneity of experience within any one period and place.

(p. 113) With regard to the study of childhood in the past, over recent years there has been a changing appreciation of the biological processes of growth and development and the way in which these are influenced by the social as well as physical environment. Bioarchaeologists studying growth and development generally observe a degree of biological regularity in developmental trajectories during infancy and childhood. Differences in growth profiles between skeletal populations are often interpreted in terms of variables such as inadequate nutrition and infectious disease. However, when interpreting the health of children the concept of 'linked lives', as well as cumulative biographies comes into play (Gowland 2015; Gowland and Newman, forthcoming).

The use of different skeletal parameters (e.g. vertebral canal size, long-bone growth) may reveal the age at which growth was affected (Watts 2013) and thus be used to infer particular cultural constructions of infancy and childhood (e.g. age at weaning or age at which children were exposed to work-related hazards) (Newman and Gowland 2015). Further, recent advances in the analysis of high resolution isotopic data from dentine has meant that information from adult remains can be obtained that reveals longitudinal dietary changes during infancy and childhood (e.g. Beaumont et al. 2013, 2015). Nitrogen and carbon isotope values can be plotted at intervals of less than one year, from just

before birth to approximately 15 years of age, depending on the tooth being sampled (Montgomery et al. 2013). When integrated with the skeletal evidence, the impact of childhood nutrition and health on adult morbidity and mortality can be observed. Likewise, similar values can be obtained for those children who did not survive to adulthood, providing high resolution comparative data for survivors and non-survivors (Beaumont et al. 2013; Montgomery et al. 2013).

Barker and Osmond (1986) helped establish a link between early life adversity and chronic disease risk when they noted a geographical patterning between the frequency of cardiovascular disease and areas with high infant mortality six decades previously. They then explored this link further in a series of papers and books from the 1980s onwards. Originally referred to as the 'Barker hypothesis', it is now more broadly known as the Developmental Origins of Health and Disease (DOHaD) hypothesis. This research has been very significant for structuring recent social policy in Britain, with an increased emphasis on the importance of pre- and post-natal infant wellbeing for population health (The Marmot Review 2010). A number of studies within palaeopathology have provided support for this hypothesis from archaeological contexts, noting correlations between indicators of health stress such as enamel hypoplasia and growth stunting, and reduced adult longevity (e.g. Armelagos et al. 2009; Watts 2011, 2013).

When considered in relation to epigenetic research, the DOHaD hypothesis should result in a more central role for the study of foetal and infant remains in archaeology. The study of past infancy, including infant care, breastfeeding, and weaning practices, have tended to be marginalized within archaeology, generally considered an offshoot of gender studies, and dominated by female scholars. However, if the experience of infancy has such profound consequences for biological and social wellbeing, archaeologists should concern themselves with studying this age group more proactively (Gowland **(p. 114)** 2015). If infant care practices carry a legacy of poor health, spanning many generations, then they can no longer be overlooked as inconsequential to society. Likewise, the Barker hypothesis emphasizes the importance of maternal health, which tends to be overlooked in relation to perinatal and infant mortality, despite being vital to the offspring (Gowland 2015). Maternal health may be affected by culturally prescribed practices relating to pregnancy, such as a special diet, or extended periods of confinement. When infants are observed with evidence of pathologies such as rickets and scurvy, as recorded at the Romano-British site of Poundbury (Dorset) (Lewis 2010; see also Lewis, Chapter 25 of this volume), then these infants may act as important proxies for the archaeological study of health in pregnancy. The developing foetus is prioritized by the pregnant body in times of nutritional stress, with resources diverted to support the needs of the infant. Nutritional deficiencies in the foetus must therefore reflect the very poor health status of their mothers.

Perinatal infant remains are therefore significant for informing archaeologists about past perceptions of infancy, but also shine an important spotlight on the 'invisible' mother, even in the absence of a direct connection in the archaeological record (e.g. mother/infant burials) (Gowland 2015). Again, isotopic analysis of perinatal infant remains can

also be particularly informative in this regard. For example, Beaumont et al. (2015) have noted a disparity between maternal δ^{15} Nitrogen values and perinatal offspring. This difference occurs because the perinatal values reflect the period of development *in utero*, whilst maternal values represent pooled data relating to the last five to ten years of the woman's life (depending on the bone sampled). Elevated δ^{15} Nitrogen values in archaeological infants are usually interpreted as providing a breastfeeding signal (see Redfern, Chapter 24 of this volume). However, such perinatal infants are unlikely to have breastfed, or at least not for the length of time required to elevate their δ^{15} Nitrogen values. Instead, Beaumont and colleagues (2015) argue that these nitrogen values may be reflecting poor maternal health. This is because, in circumstances in which the mother is ill or malnourished, the body will recycle proteins and this similarly leads to higher nitrogen values, potentially mimicking a breastfeeding signal (Beaumont et al. 2015). The perinate, therefore, provides high resolution maternal isotope values, in the absence of the mother herself. The lives of the mother and infant are bound biologically, so that one may be used as a proxy for the other, but they are also socially connected in terms of their biographies and epigenetic inheritance (Gowland 2015).

A final point about epigenetic research is the significance that it has for challenging the discrete nature of individual biographies in life course analysis. When social events affecting our ancestors have consequences for our own gene expression, we must consider lives to be linked and individuals to be 'partible' (Strathern 1988), that is, not representing discrete entities. The Western concept of the 'bounded body'—i.e. one that is separate and distinct from other human bodies—has been discussed in relation to concepts of personhood and funerary treatment in anthropological and archaeological studies. For example, Fowler (2001) discusses the concept of 'individuals' and 'dividuals', in relation to Neolithic funerary practices in which (p. 115) the remains of skeletonized bodies were commingled and manipulated after death. Likewise, Chapman (2010) discusses the distribution of body parts in Neolithic Europe as a means of materializing kinship links. The Western construct of the body as a bounded entity is a peculiarly powerful one and reinforced through cultural practices which observe the maintenance of bodily space—a liminal border zone between one's own body and other peoples. Challenges to the concept of the body's boundedness, such as through the leakage of bodily fluids, are generally regarded with repugnance. In actuality, of course, our corporeal boundaries are not fixed or discrete; our nails and hair extend beyond our skin and we shed all of these, along with our DNA and epithelial cells wherever we go, whilst inhaling and consuming similar corporeal fragments of others (Gowland and Thompson 2013). The mother/foetus dyad is the ultimate challenge to individual boundedness: the 'body within a body'. However, I would argue that epigenetic research represents a more fundamental challenge to this paradigm of the bounded body. Strathern's (1988: 185) discussion was specifically referring to Melanesian concepts of the body: 'in being multiple [the Melanesian person] is also partible, an entity that can dispose of body parts'. Given the recent research in epigenetics one could argue that contained within our bodies are physically embedded traces of our ancestors' psychosocial and biological experiences (e.g. past anxieties, dietary practices, relationships, and so forth). Their

grinding poverty or social marginalization becomes our own physiological legacy (Gowland and Newman, forthcoming). Even during life we are commingled; we are all bodies within bodies (Gowland 2015).

The life course approach emphasizes the importance of historical context and events which may influence individual biographies; in which case, those pertaining to our recent antecedents become highly relevant. Within such a paradigm, to suggest birth, or even conception, as the starting point of life seems inappropriately arbitrary and the concept of humans having discrete and separate life courses starts to become epistemologically shaky (Gowland and Newman, forthcoming). Indeed, one might argue that the ideology of reincarnation—whereby ancestors are reborn within the bodies of new infants, a belief system that is entirely alien to current Western beliefs—has greater synergies with the epigenetic model.

Conclusions

This chapter has discussed the implications of new research within the social and medical sciences for the archaeological study of infancy and the life course. Epigenetics provides an important mechanism for understanding the relationship between society and health. It has also facilitated the collapse of the mind/body divide that has structured Western knowledge for the past few centuries. Archaeological knowledge, however, is still constructed largely within these traditional boundaries. It is argued here that in terms of life course research epigenetics has also undermined a number of other (p. 116) Western constructs. It reinforces the connectivity between individuals genetically, epigenetically, physiologically, and socially (Gowland 2015). It has ramifications for our beliefs and conceptualizations regarding the beginnings of life as well as the notion that individuals have discrete and separate biographies. As archaeologists, we need to be mindful of the fact that infants can no longer be regarded as at the periphery of the human experience. They are central to the construction of past societies as are the mothers who bear them. In order to interpret the archaeological and bioarchaeological evidence for infancy and childhood in meaningful ways we should be mindful of what these remains actually embody. The skeletal remains of an infant excavated from an archaeological site does not simply represent a scrap of past humanity that never reached fruition, but is the embodiment of an accumulation of life events and social circumstances that preceded their own fractured existence. As such, they provide a portal for accessing archaeological traces of often intangible identities including motherhood.

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